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The author considers what he has found as the weakest part of a dome to be the position in which an iron belt must be placed to produce the greatest effect in counteracting the thrust of the dome. If this be done, the thickness of the pier may be considerably diminished, and need not greatly exceed the strength necessary for supporting the superincumbent weight acting vertically downwards.

III. "A Supplementary Memoir on Caustics."

By A. CAYLEY, F.R.S. Received November 15, 1866.

(Abstract.)

It is near the conclusion of my "Memoir on Caustics," *Phil. Trans.* vol. cxlvii. (1857), pp. 273, 312, remarked that for the case of parallel rays refracted at a circle, the ordinary construction for the secondary caustic cannot be made use of (the entire curve would in fact pass off to an infinite distance), and that the simplest course is to measure off the distance GQ from a line through the centre of the refracting circle perpendicular to the direction of the incident rays. The particular secondary caustic, or orthogonal trajectory of the refracted rays, obtained on the above supposition was shown to be a curve of the order 8; and it was further shown by consideration of the case (wherein the distance GQ is measured off from an arbitrary line perpendicular to the incident rays), that the general secondary caustic or orthogonal trajectory of the refracted rays was a curve of the same order 8. The last-mentioned curve in the case of reflexion, or for $\mu = -1$, degenerates into a curve of the order 6; and I propose in the present supplementary memoir to discuss this sextic curve; viz. the sextic curve which is the general secondary caustic or orthogonal trajectory of parallel rays reflected at a circle.

November 30, 1866.

ANNIVERSARY MEETING.

Lieut.-General SABINE, President, in the Chair.

Dr. Gladstone, on the part of the Auditors of the Treasurer's Accounts appointed by the Society, reported that the total receipts during the past year, including a balance of £15 9s. carried from the preceding year, amounted to £4295 16s. 11d.; and that the total expenditure in the same